Laser Safety Associated with High Energy Laser Weapon Systems

Maj Gordon T. Hengst
High Energy Laser Safety Program Manager
Optical Radiation Branch, Human Effectiveness Directorate
Air Force Research Laboratory
Brooks AFB TX 78235-5215
(210) 536-3035

As technology advances and laser systems achieve higher power in smaller packages, the issue of laser safety becomes more challenging due to larger hazard zones not only from direct beam hazards, but reflected hazards as well. To define the problem of high energy laser (HEL) safety, we first should look at the development of current technology. The reality of the situation is that HELs are becoming more common with each passing year. The DoD has several active programs to transition laboratory systems to complete weapon systems over the next 10-20 years. Several megawatt and multi-hundred kilowatt systems are now in development and getting ready for field testing and global engagement.

One advantage the laser safety community has had with most high energy laser systems is that conservative laser safety practices were developed at the very beginning of the laser development. This includes testing and operating HELs in enclosed bunkers and controlling them through remotely controlled methods to minimize accidental human exposure. As a result, there have been relatively few laser injuries and most of them result from individuals who ignore or inadvertently violate recommended safety practices. This proactive attitude towards laser safety needs to continue as the systems become higher power and more mobile. New techniques and revised safety policies will be needed as HEL systems begin to test, train and eventually employ these new high energy laser weapons in outdoor environments.